

No. 748,118.

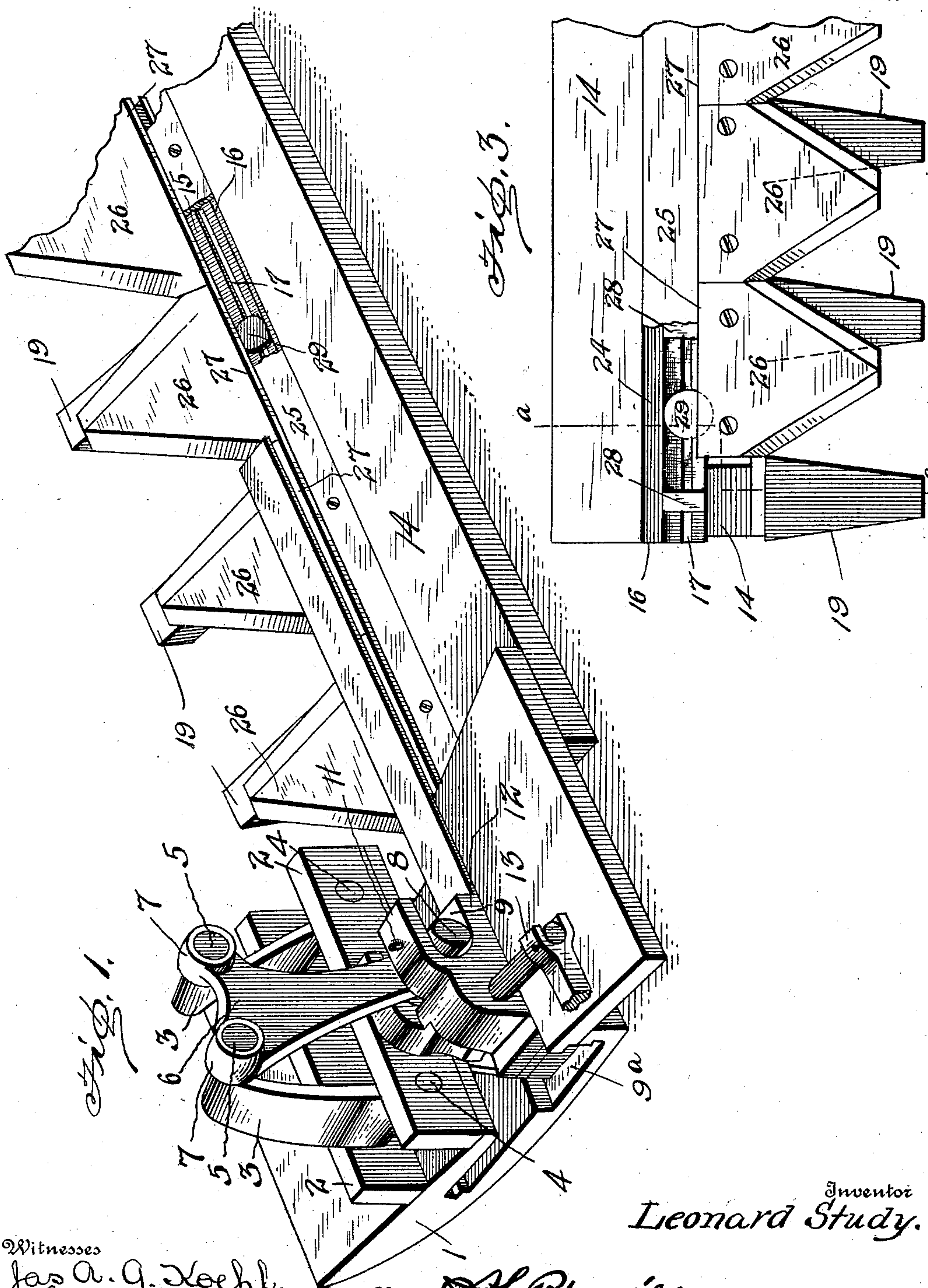
PATENTED DEC. 29, 1903.

L. STUDY.
CUTTING APPARATUS FOR MOWING MACHINES.

APPLICATION FILED FEB. 5, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

Jas A. G. Koehl.
L. C. Hilton

Inventor
Leonard Study.

By *A. B. Wilson*

Attorney

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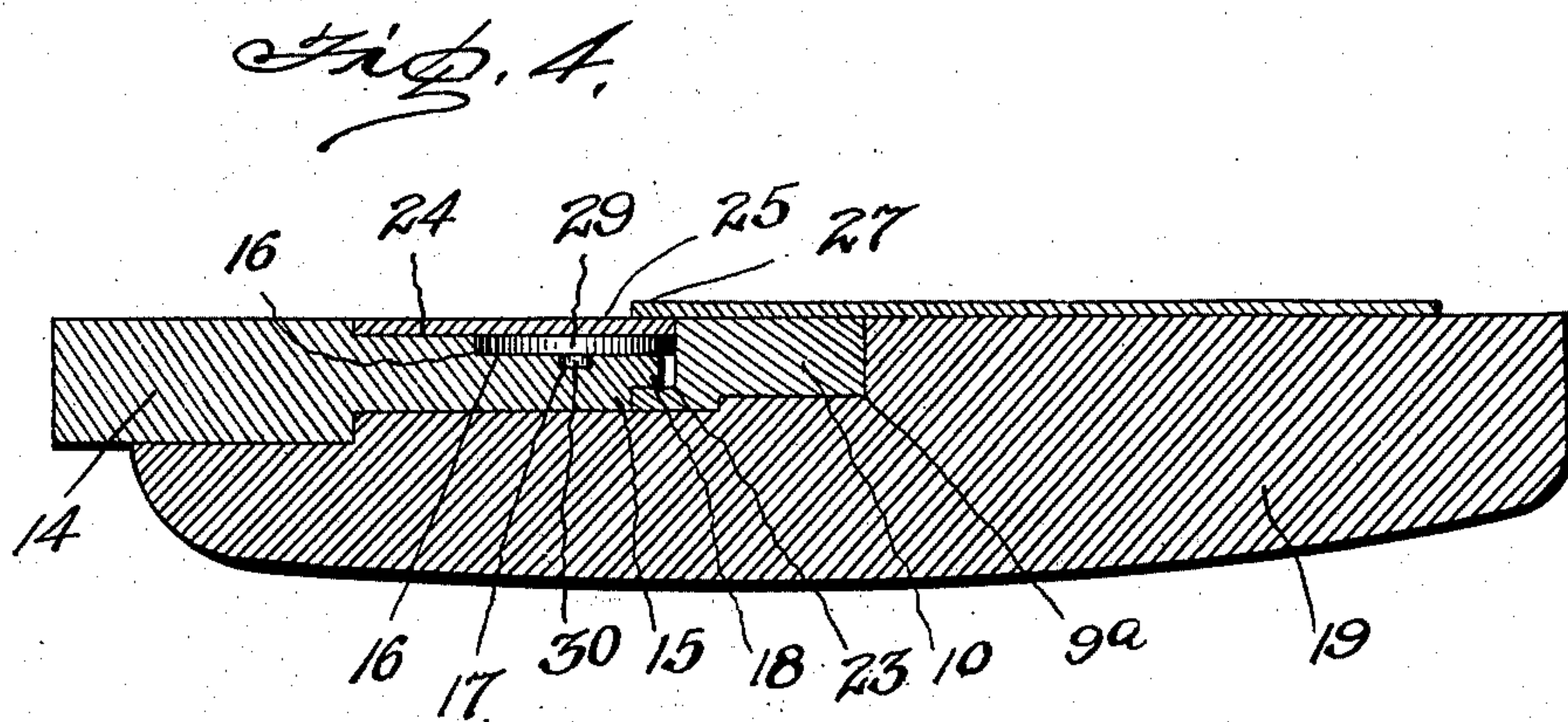
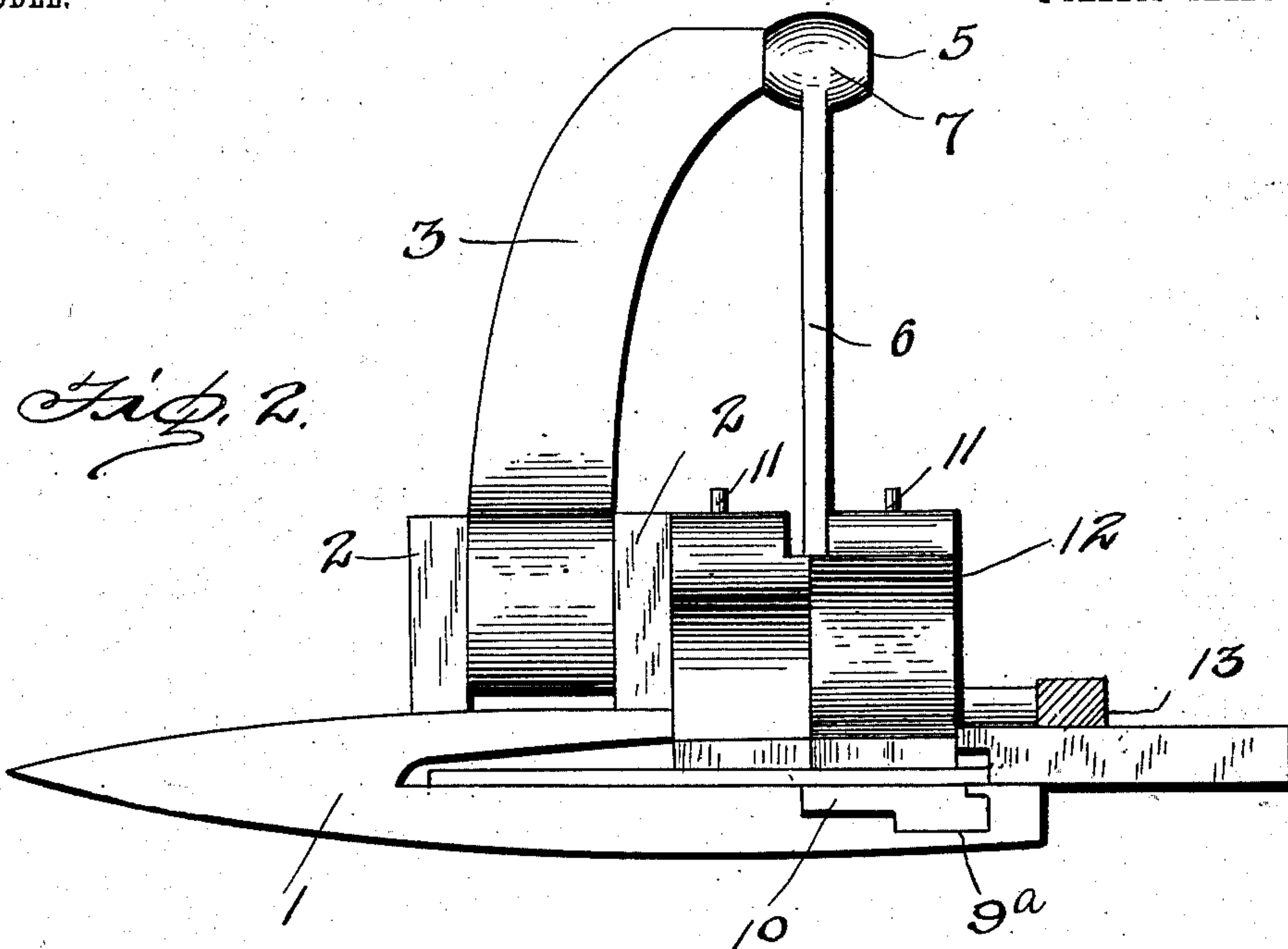
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Inventor
Leonard Study,

Witnesses
Jas A. G. Koehl.
L. Q. Hinton

By *A. B. Wilson*

Attorney

UNITED STATES PATENT OFFICE.

LEONARD STUDY, OF THURMAN, IOWA.

CUTTING APPARATUS FOR MOWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 748,118, dated December 29, 1903.

Application filed February 5, 1903. Serial No. 141,997. (No model.)

To all whom it may concern:

Be it known that I, LEONARD STUDY, a citizen of the United States, residing at Thurman, in the county of Fremont and State of Iowa, have invented certain new and useful Improvements in Cutting Apparatus for Mowing-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in cutting apparatus for mowing-machines; and it consists in the peculiar construction and combination of devices hereinafter described and claimed.

One object of my invention is to provide improved means to support the inner end of the reciprocating cutter-bar and prevent said end of said cutter-bar from moving vertically in response to the thrusts and pulls of the pitman, and thus not only steady the movements of the cutter-bar, but also reduce friction at its inner end and minimize wear of the parts at that point.

A further object of my invention is to provide improved means for reducing friction at the rear side of the cutter-bar.

A further object of my invention is to effect improvements in the construction of the finger-bar and the cutter-bar whereby an overlapped joint is effected between them, which joint effectually prevents the entrance of foreign matter between the rear sides of the cutter-bar and the front edge of the finger-bar.

In the accompanying drawings, Figure 1 is a perspective view of a portion of the cutting apparatus of a mowing-machine embodying my improvements. Fig. 2 is an end elevation of the same. Fig. 3 is a detail top plan view, partly in section, showing the antifric-tion-disks. Fig. 4 is a detail vertical transverse section taken on the plane indicated by the line *a a* of Fig. 3.

In the embodiment of my invention I provide a shoe 1 at the inner end of the cutting apparatus with bearings 2 on its upper side, in which are pivotally mounted the lower ends of a pair of oscillating links 3, the said links having journals 4 at their lower ends engaging said bearings and being here shown as provided at their upper ends with rearwardly-

extending journals 5. An oscillating arm 6, which is substantially triangular in form, is provided at its upper corners with bearings 7, spaced apart an appropriate distance and engaged with the journals 5. Thereby the said oscillating arm 6 is pivotally connected to the upper ends of both of the oscillating links 3. At the lower end of said oscillating arm 6 is a cross-journal 8, which engages a bearing-slot 9 in a head 12 on the upper side of the cutter-bar 10, at the inner end of the said cutter-bar, and thereby the said oscillating arm is pivotally connected to the end of the cutter-bar. The latter operates in a race 9^a. By the provision of the slot 9 the cross-journal 8 may be readily unshipped from the bearing at the inner end of the cutter-bar. Suitable pins 11 are here shown to retain the cross-journal in the said bearing-slot. Any suitable device may be substituted for these pins, and I do not limit myself in this particular.

The head 12 at the inner end of the cutter-bar may be either of the form here shown or of any other preferred form and is adapted to be connected to the usual pitman 13. Only a portion of the latter is shown, and I do not show the apparatus for actuating the pitman, as the same is well understood by those skilled in the art to which my invention relates and forms no part of my present improvements.

When the cutter-bar is moving back and forth, the oscillating links 3 and arm 6 are rocked therewith. As the said oscillating links describe their respective movements, the respective pivotal connections between the same and the upper corners of the arm 6 move simultaneously in reverse directions—that is to say, one moves upwardly while the other moves downwardly—and hence the pivotal connecting parts 8 between the cutter-bar and the oscillating arm 6 are moved parallel with the plane of reciprocating movement of the cutter-bar, and the inner end of the latter is at all times retained in the same vertical plane. Its motion is hence steadied, and its inner end is prevented from being moved upwardly and downwardly by the action of the pitman. This reduces friction of the inner end of the cutter-bar and the housing 13, in which it is longitudinally guided, and wear between the said parts is minimized.

The finger-bar 14 is provided at its front side with a forwardly-extending supporting-flange 15, a shoulder or race 16 being formed at the rear side of and above said flange.

5 The latter has in its upper side at a suitable distance from said shoulder or race a longitudinal groove 17, and a flange 18 projects forwardly from the flange 15. The cutter-bar 10 is provided on its rear side with a rearwardly-extending flange 23, which bears against and lies under the flange 18 of the finger-bar, said flanges 18 and 23 coacting to form an overlapped joint between the under side of the cutter-bar and the under side of the finger-bar, which overlapped joint effectually prevents foreign particles from getting between the finger-bar and cutter-bar.

In the upper portion of the finger-bar immediately in rear of the flange 15 is a longitudinal recess 24, in which lies the rear side of a housing, strip, bar, or plate 25, the same extending forwardly over the flange 15, being spaced therefrom by the shoulder 16 and extending to the rear side of the cutter-bar.

25 The cutter-plates 26, carried by the cutter-bar, have their rear portions extending to form flanges 27, which bear on the upper side of the front portion of the housing, bar, plate, or strip 25. The space between the upper side of the flange 15 of the cutter-bar and the under side of the housing, plate, bar, or strip 25 is divided into a number of races of suitable length by cross-plates 28, which are secured either to the upper side of the flange 15 or to the lower side of said housing, strip, bar, or plate, as may be preferred. In each of these races is disposed a bearing-disk 29 of suitable diameter to bear against the shoulder 16 and also the rear side of the cutter-bar, and these bearing-disks, which are adapted to rotate alternately in reverse directions to correspond with the motion of the cutter-bar and to also move longitudinally in reverse directions therewith and in their respective races, are provided on their under sides with axial centrally-disposed studs 30, that operate in the grooves 17. By this construction friction at the rear side or heel of the cutter-bar is minimized, as will be understood, and wear thereof is also minimized.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In the cutting apparatus of a mowing-machine, the combination of a pair of oscillating elements having relatively fixed piv-

otal supports, an oscillating element pivotally connected to the respective first-mentioned oscillating elements at points equally spaced from opposite sides of its longitudinal axis, a reciprocating cutter-bar pivotally connected to the said oscillating element at a point coincident with the longitudinal axis thereof, whereby the pivotal connection between said reciprocating cutter-bar and said oscillating element is prevented from moving perpendicularly to the plane of motion of the said reciprocating cutter-bar, substantially as described.

2. In a mowing-machine, the combination of a reciprocating cutter-bar, a relatively fixed element, a pair of rocking links spaced apart and pivotally connected thereto, an oscillating arm connecting the free ends of the rocking links together and pivotally connected thereto, the pivotal connections between the said links and the said arm being on opposite sides of the longitudinal axis of the arm, and a pivotal connection between the said arm and the cutter-bar, substantially as described.

3. In the cutting apparatus of a mowing-machine, the combination of a finger-bar having a forwardly-extending flange, with a longitudinal groove in its upper side and a shoulder at and above the rear side of said flange, a bearing-disk disposed to rotate and move longitudinally on said flange, bearing against said shoulder and having an axle-stud operating in said groove, and a reciprocating cutter-bar having its rear side engaged by said bearing-disk, substantially as described.

4. The combination of a finger-bar having races in its front side and grooves parallel and communicating with said races, bearing-disks in the latter, having axle-studs operating in said grooves, and a reciprocating cutter-bar having its rear side engaged by said bearing-disks, substantially as described.

5. In the cutting apparatus of a mowing-machine, the combination of a relatively fixed supporting element, a pair of rocking elements spaced apart and pivotally connected thereto, an oscillating element, spaced pivots connecting the oscillating element to the rocking elements, and movable by the latter orbitally and reversely in intersecting arcs, and a reciprocating cutter-bar pivotally connected to said oscillating element, the path of movement of the pivotal connection between said oscillating element and said reciprocating cutter-bar being parallel to that of the latter, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LEONARD STUDY.

Witnesses:

B. T. BAKER,
N. R. KENEEDY.